

Citation:

van der Horst K, Oenema A, Ferreira I, Wendel-Vos W, Giskes K, van Lenthe F, Brug J. A systematic review of environmental correlates of obesity-related dietary behaviors in youth. *Health Educ Res*. 2007 Apr;22(2):203-26.

PubMed ID: [16861362](#)

Study Design:

Systematic Review

Class:

M - [Click here](#) for explanation of classification scheme.

Research Design and Implementation Rating:



POSITIVE: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

The purpose of this review aimed to address the following specific research questions:

- (i) Which environmental correlates have been studied in relation to child and adolescent energy, fat (total and energy percent), fruit, vegetable, snack, fast food and soft drink intake? and
- (ii) Which environmental factors are consistently associated with these obesity-related dietary behaviors?

Inclusion Criteria:

- Studies eligible for inclusion in the review were located from the Medline (PubMed), PsychInfo, Web of Science and Human Nutrition databases, from January 1980 to December 2004.
- Healthy young people in the age range of 3–18 years (or mean age within this range) as subjects of study; a measure of energy and/or fat intake (total or percent energy), fruit, vegetable, snack, fast food or soft drink consumptions as the dependent variables and an outcome measure that was assessed for at least one complete day.
- The study samples had to be drawn from countries with established market economies as defined by the World Bank, and the paper had to be published in international peer-reviewed journals in English.

Exclusion Criteria:

- Studies assessing fruit intakes at just one meal were not eligible.
- Intervention studies and studies that included only overweight/obese children were excluded.

Description of Study Protocol:

Recruitment

- The databases search located 6616 titles (Pubmed 1975; PsychInfo 317; Web of Science 2932; Human Nutrition 1392), resulting in 6121 unique titles of potentially relevant articles.
- Reference sections of earlier reviews and primary studies added 44 titles.
- Screening the titles and abstracts resulted in a selection of 81 articles, for full-text review. Twenty-three of these articles did not meet the inclusion criteria, resulting in a final inclusion of 58 articles with 77 samples.

Design

- A systematic review of observational studies on environmental correlates of energy, fat, fruit/vegetable, snack/fast food and soft drink intakes in children (4–12 years) and adolescents (13–18 years) was conducted.

Blinding used (if applicable)

NA

Intervention (if applicable)

NA

Statistical Analysis

- Associations between environmental factors and dietary outcomes were coded as '+' for a positive association, '-' for an inverse association and '0' for no association.
- Associations were regarded significant when the *P* value reported in the study was <0.05. In studies that reported results from univariate and multivariate analysis, only the multivariate results were included.
- To reduce the number of specific environmental correlates studied, conceptually similar environmental factors were combined (e.g. intakes from father and mother to parental intake).
- An independent sample was used as the unit of analysis and was defined as the smallest independent subsample for which relevant data were reported (e.g. boys/girls).

Data Collection Summary:

Timing of Measurements

- This is a systematic review of observational studies eligible in the review were located from the Medline (PubMed), PsychInfo, Web of Science and Human Nutrition databases, from January 1980 to December 2004.

Dependent Variables

- Obesity-related dietary behaviors
- Energy, fat (total and energy percent), fruit, vegetable, snack, fast food and soft drink intake
- Age : children (3- to 12-year olds) and adolescents (>12- to 18-year olds)

Independent Variables

- Environmental settings, i.e. home/household, educational institutions, neighborhoods, city/municipality
- Various types of environmental factors: physical, sociocultural, economic and political

Control Variables

- Environmental factors and dietary behaviors

Description of Actual Data Sample:

Initial N: 81 articles

Attrition (final N): 58 articles

Age:

Children (3–12 years)

Adolescents (13–18 years)

Ethnicity: Subjects from North America, Europe, Oceania Asia

Other relevant demographics: study design, assessment of dietary intake, data analysis and country,Environmental determinants of fruit/vegetable intake ,determinants of fat intake ,determinants of fast food/snack intake ,determinants of energy intake and determinants of soft

drink intake .

Anthropometrics NA

Location: North America, Europe, Oceania Asia

Summary of Results:

- Most of the studies were cross-sectional ($n = 55$). Twenty-nine studies (37 samples) had children as the study population, and 27 (40 samples) included adolescents.
- The 58 papers reviewed mostly focused on sociocultural and economical–environmental factors at the household level.
- The most consistent associations were found between parental intake and children's fat, fruit/vegetable intakes, parent and sibling intake with adolescent's energy and fat intakes and parental education with adolescent's fruit/vegetable intake.
- A less consistent but positive association was found for availability and accessibility on children's fruit/vegetable intake.
- Environmental determinants of fruit/vegetable intake were examined in 34 studies, determinants of fat intake in 23 studies, determinants of fastfood/snack intake in 21 studies, determinants of energy intake in 17 studies and determinants of soft drink intake in 10 studies.
- Only five studies reported the validity and seven studies reported the reliability of the dietary intake measurements used.
- One study examined factors in the school environment, no studies examined factors in the neighborhood environment and two studies examined factors at the city/municipality level. At the household sociocultural level, an inverse association with energy intake was found for encouragement, offering assistance and giving prompts to increase food intake during meals in two out of three samples.
- One study examined factors in the school environment, no studies examined factors in the neighborhood environment and two studies examined factors at the city/municipality level. At the household sociocultural level, a positive association was found for parental fat intake (three out of three samples), and parental control over food intake (two out of two samples). Parental education was inversely associated with fat intake in two out of two samples.
- One study examined factors in the school environment, one study (two samples) examined factors in the neighborhood environment and no studies examined factors at the city/municipality level. At the household physical level, availability of fruit/vegetables was associated with higher fruit/vegetable intake in four out of seven samples.
- Accessibility of fruit/vegetables was positively associated with fruit/vegetable intake in four out of six samples. At the household sociocultural level, positive associations were found for modeling (two out of two samples/studies) and parental intake of fruit/vegetables (six out of six samples).
- No studies examined factors in the school environment, one study (two samples) examined factors in the neighborhood and one study examined factors at the city/municipality level. None of the factors examined showed consistent associations with snack/fast food intake.
- One study examined factors in the school environment and no studies examined factors in the neighborhood or city/municipality environment. At the household sociocultural level, parental soft drink intake was positively associated with children's soft drink intake in two out of two samples.
- No studies examined factors in the school, neighborhood or city/municipality environment. At the household sociocultural level, parental energy intake was positively associated with adolescent's energy intake (six out of six samples). A positive association was also found for sibling intake (four out of four samples).
- One study examined factors in the school environment and no studies examined factors in the neighborhood. One study (two samples) examined factors at the city/municipality level. At the household sociocultural level, parental fat intake was found to be positively associated with adolescent's fat intake (eight out of nine samples). A positive association was also found for sibling intake (four out of four samples).
- One study examined factors in the school environment, one study examined factors in the neighborhood environment and one study (two samples) examined factors at the city/municipality level. At the household sociocultural level, an authoritative parenting style was positively associated with fruit/vegetable intake (two out of two samples). Family connectedness was positively associated with adolescent fruit/vegetable intake (two out of two samples). At the household economic level, parent educational level was found to be positively associated with fruit/vegetable intake (six out of six samples).
- One study examined factors in the school environment, no studies examined factors in the neighborhood environment and one study (two samples) examined factors at the city/municipality level. None of the factors examined showed consistent associations with snack/fast food intake.
- No studies examined factors in the school and neighborhood environment. One study (two samples) examined factors at the city/municipality level. None of the factors examined showed consistent associations with soft drink intake. Factors studied on the school environmental level (physical and sociocultural) were mostly single studies.

Author Conclusion:

- Environmental factors are predominantly studied at the household level and focus on sociocultural and economic aspects.
- This review showed consistent evidence (findings replicated in multiple studies), for the relationship between parental intake and children's fat, fruit and vegetable intake, for parent and sibling intakes with adolescent's energy and fat intake and for parent educational level with adolescent's fruit and vegetable intake.
- A positive association was found for the relationship between availability and accessibility with children's fruit and vegetable intake, even though the samples that found a positive association only slightly outnumbered the samples that found no association.
- Further positive associations were found for controlling/restrictive practices (fat), parent educational level (fat), modeling (fruit/vegetable), parental intake (soft drink), parenting style (fruit/vegetable), family connectedness (fruit/vegetable) and encouragement to increase food intake (fruit/vegetable). A negative association was found for encouragement/assistance/prompts (energy).
- Most consistent associations were found for parental influences (parental intake and education).
- More studies examining environmental factors using longitudinal study designs and validated measures are needed for solid evidence to inform interventions.

Reviewer Comments:

- This is a well written systematic review. No data on subjects BMI and family history of overweight and obesity in this review. More details on demographic details are required.

Research Design and Implementation Criteria Checklist: Review Articles

Relevance Questions

- | | | |
|----|---|-----|
| 1. | Will the answer if true, have a direct bearing on the health of patients? | Yes |
| 2. | Is the outcome or topic something that patients/clients/population groups would care about? | Yes |
| 3. | Is the problem addressed in the review one that is relevant to nutrition or dietetics practice? | Yes |
| 4. | Will the information, if true, require a change in practice? | Yes |

Validity Questions

- | | | |
|-----|--|-----|
| 1. | Was the question for the review clearly focused and appropriate? | Yes |
| 2. | Was the search strategy used to locate relevant studies comprehensive? Were the databases searched and the search terms used described? | Yes |
| 3. | Were explicit methods used to select studies to include in the review? Were inclusion/exclusion criteria specified and appropriate? Were selection methods unbiased? | Yes |
| 4. | Was there an appraisal of the quality and validity of studies included in the review? Were appraisal methods specified, appropriate, and reproducible? | Yes |
| 5. | Were specific treatments/interventions/exposures described? Were treatments similar enough to be combined? | Yes |
| 6. | Was the outcome of interest clearly indicated? Were other potential harms and benefits considered? | Yes |
| 7. | Were processes for data abstraction, synthesis, and analysis described? Were they applied consistently across studies and groups? Was there appropriate use of qualitative and/or quantitative synthesis? Was variation in findings among studies analyzed? Were heterogeneity issues considered? If data from studies were aggregated for meta-analysis, was the procedure described? | Yes |
| 8. | Are the results clearly presented in narrative and/or quantitative terms? If summary statistics are used, are levels of significance and/or confidence intervals included? | Yes |
| 9. | Are conclusions supported by results with biases and limitations taken into consideration? Are limitations of the review identified and discussed? | Yes |
| 10. | Was bias due to the review's funding or sponsorship unlikely? | Yes |

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